User Manual

Terminal PUE 5 series

For cooperation with tensometers

Manual number:
ITKU-41-04-09-11-A

MANUFACTURER OF ELECTRONIC WEIGHING INSTRUMENTS

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TABLE OF CONTENTS

1. INTENDED USE 4
2. PRECAUTIONS 4
3. WARRANTY CONDITIONS 4
4. MAIN DIMENSIONS 5
5. DESCRIPTON OF CONNECTORS 6
6. UNPACKING AND ASSEMBLY 7
7. GETTING STARTED 7
8. KEYS' FUNCTIONS 8
9. SOFTWARE STRUCTURE 8
9.1. List of software menu 8
9.2. Parameters of scale software 9
9.2.1. Readout of parameters 9
9.2.2. Save parameters procedure 9
9.3. Setting a filtering level 10
9.4. Median filter 11
9.5. Autozero 11
9.6. Scale software settings 12
9.7. Run / close scale software 13
10. ERROR MESSAGES 13
11. DIAGRAMS OF CONNECTION CABLES 14
11.1. USB cable (adapter) 14
11.2. USB printer cable 14
11.3. RS232 printer cable 15
11.4. Ethernet cable 15
11.5. RS232 terminal – computer cable 16
11.6. RS232, RS485 cable – colors. 16
11.7. RS232C cable – colors 16
12. CONNECTORS 17
12.1. RS232, RS485 connector 17
12.2. Ethernet connector 17
12.3. USB connector 17
12.4. RS232C connector 17
13. SPECIFICATION OF ADDITIONAL MODULES 18
13.1. Weighing module MW-02 18
13.1.1. Technical specification 19
13.1.2. Colours of wires 19
13.2. Principles of connectivity of tensometers 20
13.2.1. The way of installing inside PUE 5 22
13.3. Additional 8 inputs / 8 outputs module 23
13.3.1. Technical specification 23
13.3.2. Installing method in PUE 5 terminal 24
13.3.3. I/O diagram 25
13.3.4. Description of input output wires PT0082: 25
13.4. WE 4 - 4 inputs / 4 outputs module 26
13.4.1. Technical specification 26
13.4.2. Colours of cables for I/O PT0083: 26
13.4.3. Installing method in PUE 5 terminal 27
13.5. Analogue output module AN series. 27
13.5.1. Technical specification 28
13.5.2. The way of installing inside PUE 5 28
13.5.3. Configuration of work modes of analogue modules 29
13.5.4. Connections to AN module 29
13.6. Profibus interface DP V1 30
13.6.1. Technical specification 31
13.6.2. Colours of wires 31
13.6.3. The way of installing inside PUE 5 31
14. ADDITIONAL EQUIPMENT 33
15. TECHNICAL PARAMETERS 33

1. INTENDED USE

PUE 5 is a weighing terminal in stainless steel housing designed for industry. Big 12,1” colour display with touch screen allows to operate the software intuitively without using keyboard.

Application of commonly used operational systems gives possibility to produce software by external companies and use of already existing software. Application of personal computer facilitates the use of device in one-stand and net systems. Terminal has possibility of cooperation with two weighing platforms (option).

2. PRECAUTIONS

A. Please, read carefully this user manual before and use the device according to its intended use;
B. Weighed loads should be placed in possibly central part of scale pan;
C. Do not clean the device with agents causing corrosion;
D. Weighing pan should be loaded with goods having gross mass lower than maximal capacity of the scale;
E. Do not leave for longer period of time higher loads on the pan;
F. In case of failure, immediately disconnect scale power supply;
G. Devices that are to be withdrawn from usage should be utilized according to the law.

3. WARRANTY CONDITIONS

A. RADWAG is obliged to repair or change those elements that appears to be faulty because of production and construction reasons,
B. Defining defects of unclear origin and outlining methods of elimination can be settled only in participation of a user and the manufacturer representatives,
C. RADWAG does not take any responsibility connected with destructions or losses derived from non-authorized or inappropriate (not adequate to manuals) production or service procedures,

D. Warranty does not cover:

- Mechanical failures caused by inappropriate maintenance of the device or failures of thermal of chemical origin or caused by atmospheric discharge, over voltage in mains or other random events,
- Inappropriate cleaning.

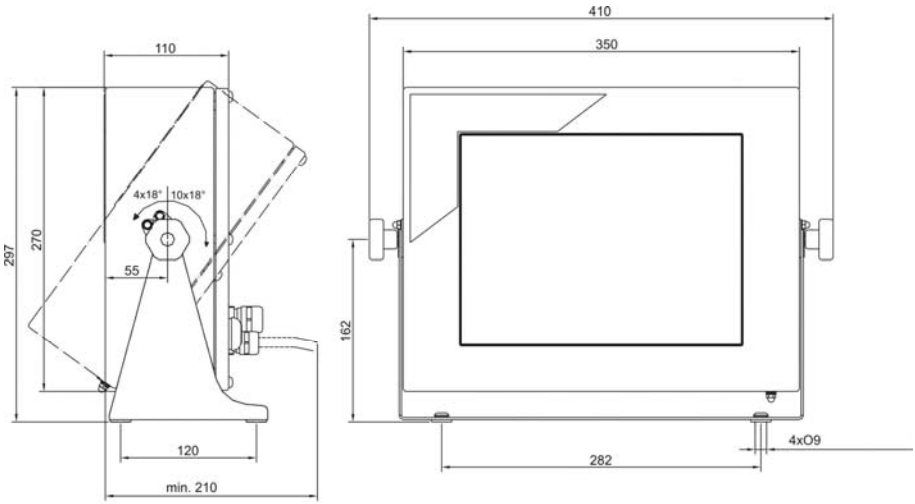
E. Loss of warranty appears after:

- Access by an unauthorized service,
- Intrusion into mechanical or electronic construction of unauthorized people,
- Removing or destroying protection stickers.

F. The detailed warranty conditions one can find in warranty certificate.

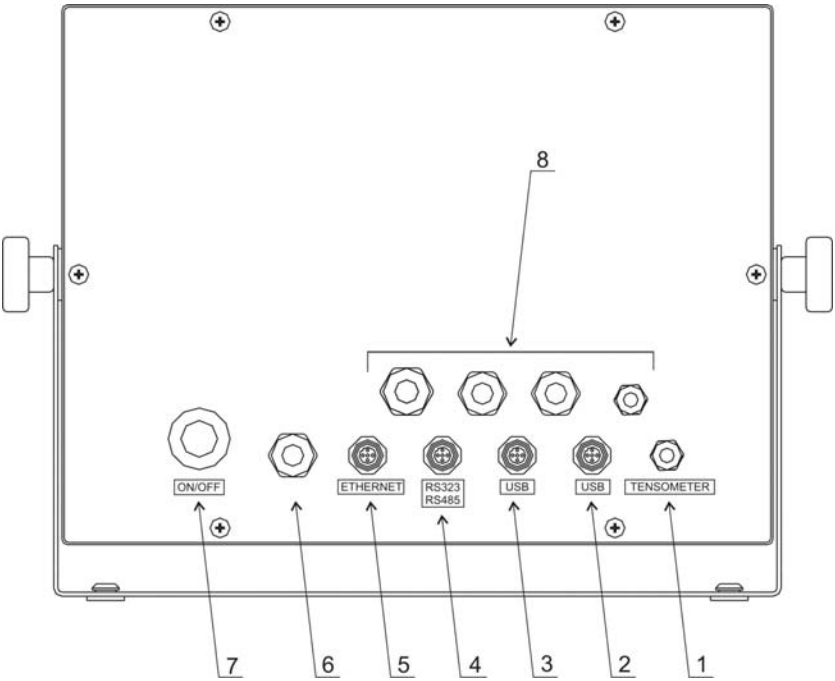
G. Contact with the central authorized service:+48 48 384 88 00 ext. 106 or 107.

4. MAIN DIMENSIONS



Main dimensions of PUE 5

5. DESCRIPTON OF CONNECTORS



Back side view of PUE 5

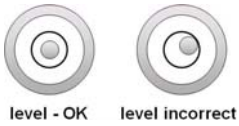
Connectors in standard versions:

1 *Tensometer cable gland*
2 *USB connector*
3 *USB connector*
4 *RS232, RS485 connector*
5 *Ethernet connector*
6 *Power cord cable*
7 *ON/OFF switch*
8 *Glands for optional equipment (8IN/8OUT, 4IN/4OUT, RS485 via gland, additional platform, etc)*

NOTICE:
The possibility of using subsequent connectors in any configuration.

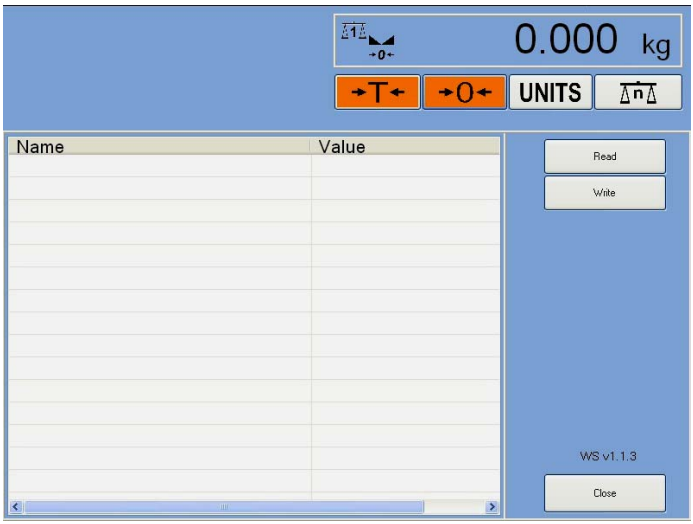
6. UNPACKING AND ASSEMBLY

A. Remove the scale from factory packaging,
B. Place the scale on flat and hard surface far from heat sources,
C. Scale should be levelled by turning regulation feet. Levelling is correct if air bubble is in central position.



7. GETTING STARTED

- Power up the scale by pressing the **ON/OFF** switch on the back wall of the terminal. Then the procedure of running Windows will start.
- When start procedure is finished, software window will be started automatically:



- Simultaneously in scale window following symbols will be displayed:

  →0← - precise zero indication

  - measurement result is stable

  kg - weighing unit

If weighing result is different from zero –press zeroing key.

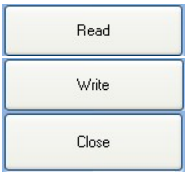
8. KEYS' FUNCTIONS

Scale zeroing

Scale tarring

Change of weighing platform number

Change of weighing unit



Read scale parameters

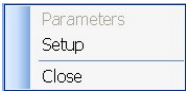
Save scale parameters

Close application

9. SOFTWARE STRUCTURE

9.1. List of software menu

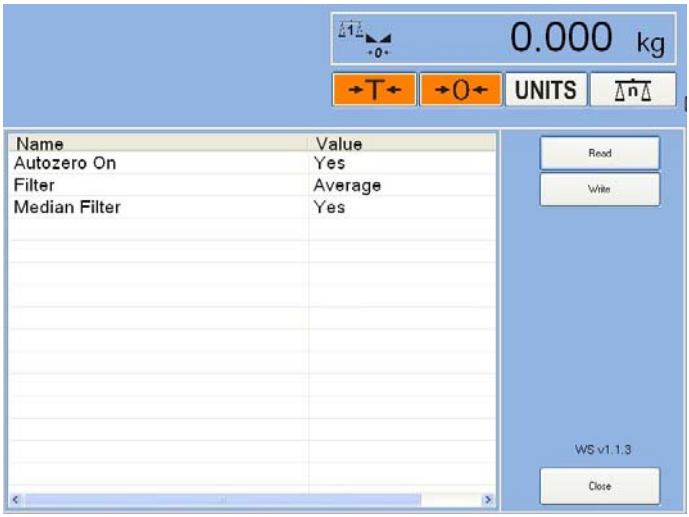
Hold finger for about 2 s on scale software window, menu list of accessible software will be displayed:



9.2. Parameters of scale software

9.2.1. Readout of parameters

To read out scale parameters press key Read, scale software will indicate parameters list accessible for edition:



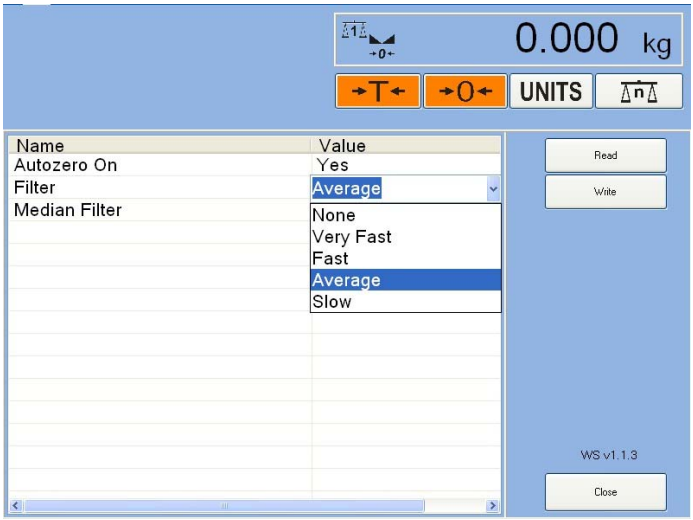
9.2.2. Save parameters procedure

After changing parameters value carry out saving procedure by pressing key Write. When saving procedure is finished scale software will indicate message:

9.3. Setting a filtering level

Procedure:

- Perform the readout of parameters according to 9.2.1 of the manual,
- Display the list of possible settings of the parameter:



After selecting the required value save parameters according to 9.2.2 of the manual.

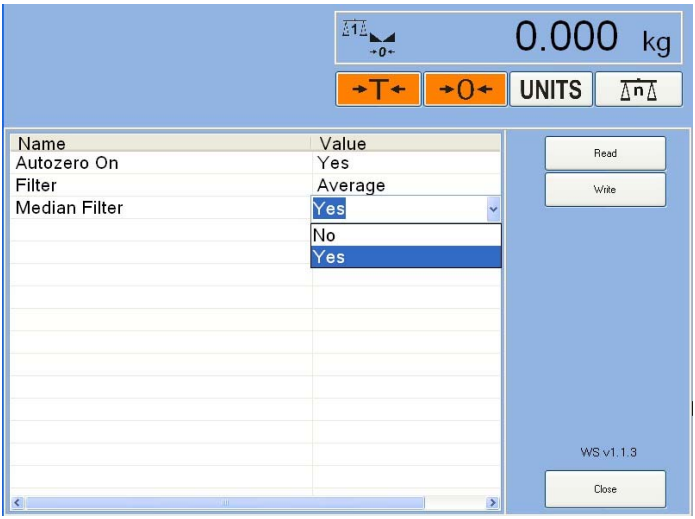
Notice:
The higher filtering level the longer stabilization time.

9.4. Median filter

This filter eliminates short mechanical shocks.

Procedure:

- Perform the readout of parameters according to 9.2.1 of the manual,
- Display the list of possible settings of the parameter:



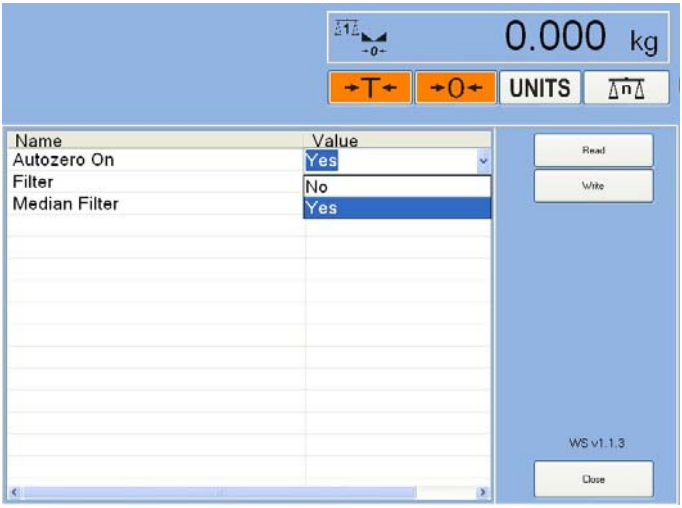
After selecting the required value save parameters according to 9.2.2 of the manual.

9.5. Autozero

The autozero function has been implemented in order to assure precise indications. This function controls and corrects **„0”** indication.
While the function is active it compares the results continuously with constant frequency. If two sequentional results differ less than the declared value of autozero range, so the scale will be automatically zeroed and the pictograms and→0← will be displayed.
When AUTOZERO is disabled zero is not corrected automatically. However, in particular cases, this function can disrupt the measurement process e.g. slow pouring of liquid or powder on the weighing pan. In this case, it is advisable to disable the autozero function.

Procedure:

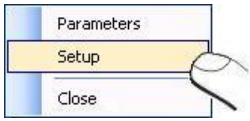
- Perform the readout of parameters according to 9.2.1 of the manual,
- Display the list of possible settings of the parameter:



After selecting the required value save parameters according to 9.2.2 of the manual.

9.6. Scale software settings

After starting menu list of program (see point 9.1 of manual) press with finger option **<Settings>**:



Scale software will display settings window:

Confirm change of parameters value with key OK.

Notice:
Additional weighing platform module MW02 is working on port **COM2**.

Languages available:

- Auto - Setting language version compatible with the version of the operating system.
- Polish
- English
- German

Set the path to the software keyboard on:
C:\Program Files\Klawiatura ekranowa\KEYBOARD_mini.exe

9.7. Run / close scale software

In order to exit the program press the button

on the main window.

In order to rerun scale software proceed as follows:

- Press the **START** button on the taskbar,
- press **Programs**,
- press **RADWAG**,
- press **WeighingServer**,

Window program **WeighingServer** will be open.

10. ERROR MESSAGES

Err2	-	Value beyond zero range
Err3	-	Value beyond tare range
Err8	-	Exceeded time of tarring / zeroing operation
null	-	A/D converter zero value
FULL2	-	Measurement range exceeding
LH	-	Start mass error, indication beyond (from -5% to +15% range of start mass)

11. DIAGRAMS OF CONNECTION CABLES

The scale in STANDARD version can cooperate with:

- computers
- slip printers KAFKA, EPSON, KYOLINE
- label printers CITIZEN, ZEBRA,

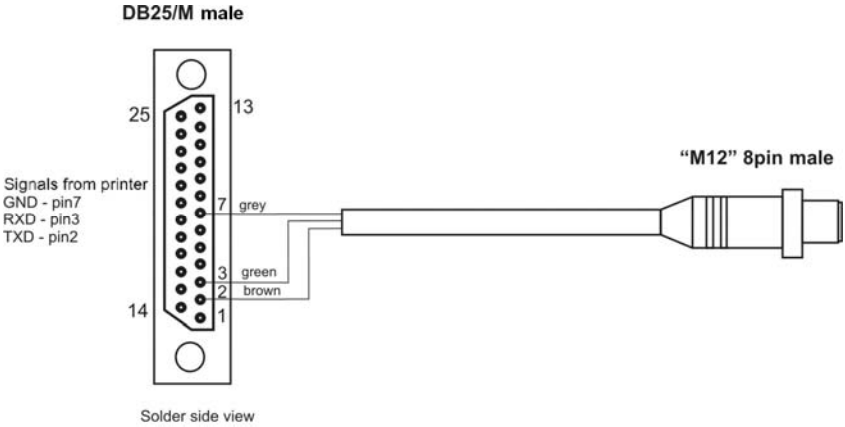
11.1. USB cable (adapter)

USB cable (adapter) *PT0084*

11.2. USB printer cable

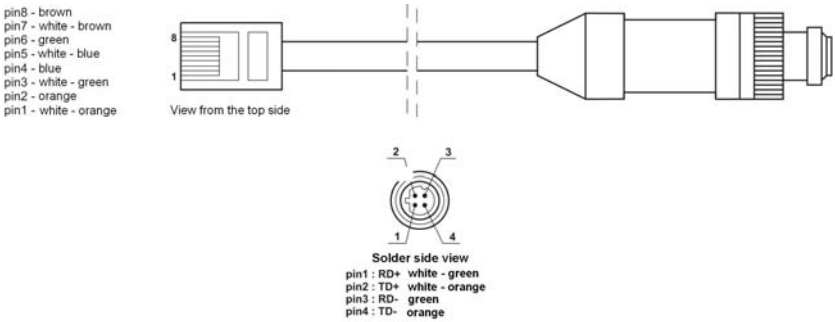
USB printer cable PT0087

11.3. RS232 printer cable



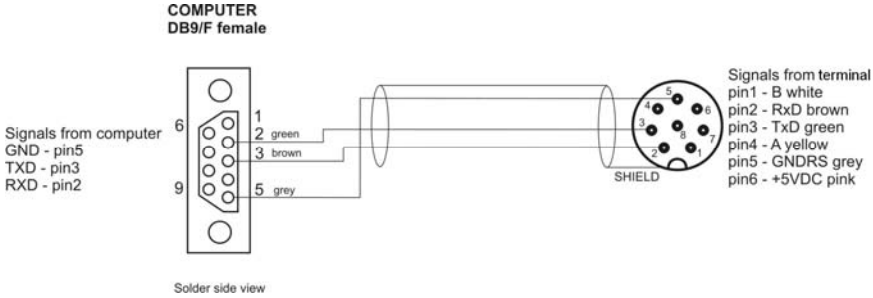
RS232 printer (CITIZEN, EPSON) cable PT0019.

11.4. Ethernet cable



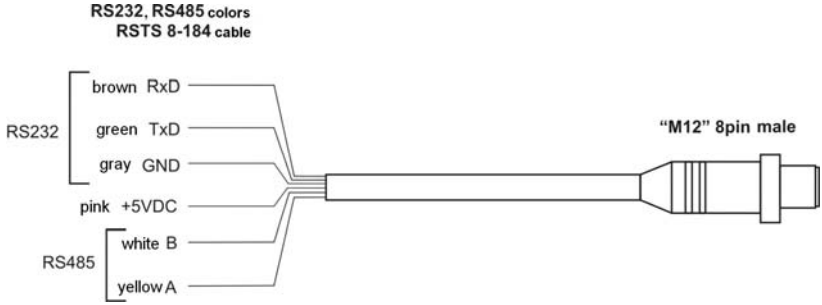
Ethernet cable P0198

11.5. RS232 terminal – computer cable



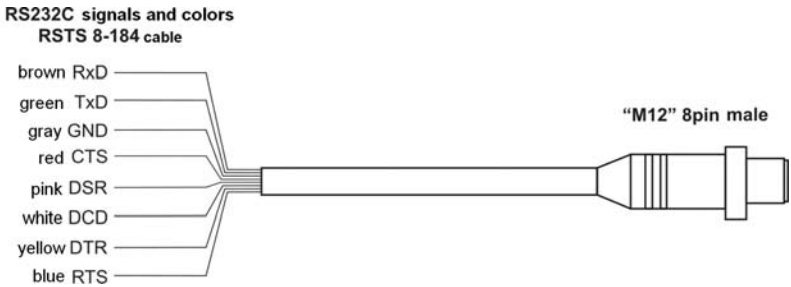
RS232 terminal – computer cable PT0020

11.6. RS232, RS485 cable – colors.



Colors for "M12" standard cables. The figure gives an example of the type of cable.

11.7. RS232C cable – colors

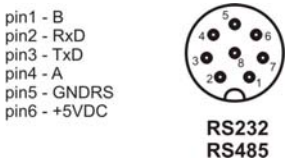


Colors for "M12" standard cables. The figure gives an example of the type of cable.

12. CONNECTORS

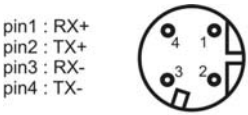
Caution:
In accordance to the number of mounted modules the number and the placement of glands and connectors can vary. Connectors and glands mentioned in the standard solution appears in every option in the same place regardless of the option.

12.1. RS232, RS485 connector



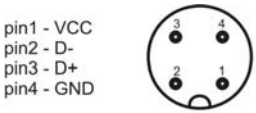
RS232, RS485 connector (View of plugin side)

12.2. Ethernet connector



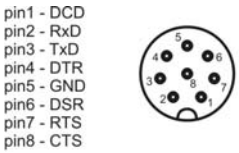
Ethernet connector (View of plugin side)

12.3. USB connector



USB connector (View of plugin side)

12.4. RS232C connector



RS232C connector (View of plugin side)

13. SPECIFICATION OF ADDITIONAL MODULES

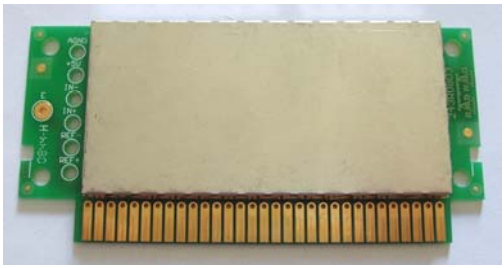
Apart from standard interface, it is possible to equip terminals PUE 5 with additional module increasing functionality of devices:

- Weighing module **MW-02**
- 8 inputs / 8 outputs module **WE 8**,
- 4 inputs / 4 outputs module **WE 4**,
- Analogue outputs module **AN**,
- Interface Profibus **DP V1**.

13.1. Weighing module MW-02

The weighing module MW-02 is totally responsible for the process of weighing. It includes the memory for factory parameters and scale parameters (calibration parameters, filters, divisions, etc.) It is mounted to the main board of PUE 5.

Factory parameters are protected and can be accessible only after pressing the calibration switch on the module during powering up. The module is totally covered by the shield together with the calibration switch and soldering pads of load cell. The calibration switch is accessible through the hole in the shield and can be additionally sealed with an external sticker.



Weighing module MW-02

13.1.1. Technical specification

Useful number of internal divisions	8 388 608
OIML class	III
Number of verification divisions	6000e
Maximal change of input signal	19mV
Maximal voltage per verification divisions	3,3 µV
Minimal voltage per verification divisions	1µV
Minimal tensometer impedance	90Ω
Maximal tensometer impedance	1200Ω
Tensometer excitation voltage	5V
Types of tensometers	4 or 6 wires + shield

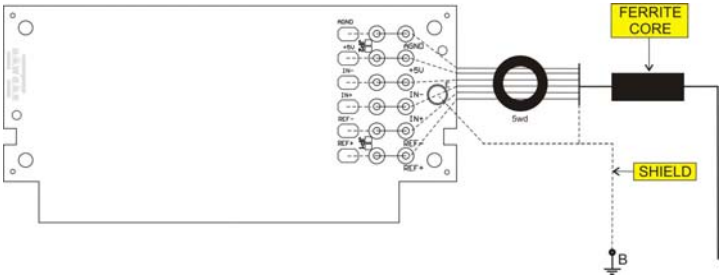
13.1.2. Colours of wires

Designation of sensor tensometric.	**Colors according to the RADWAG standard**	**Designation of weighing module**
+INPUT	brown	+5V
-INPUT	green	AGND
+OUTPUT	yellow	+IN
- OUTPUT	white	-IN
+SENSE	gray	+REF
- SENSE	pink	- REF
EKRAN	yellow-green	(according to the rule of connecting shields)

13.2. Principles of connectivity of tensometers

- **6-wire load cell cables**

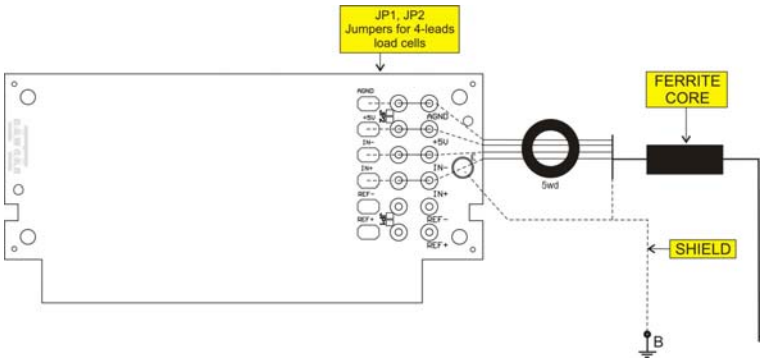
For 6-wire load cell cables look at the drawing below:



SIGNAL FROM WEIGHING MODULE	SIGNAL FROM TENSOMETER	NOTICE
E	EKRAN	(according to the rule of connecting shields)
REF+	SENSE +	(JP1 not soldered)
REF-	SENSE -	(JP2 not soldered)
IN+	OUTPUT+	
IN-	OUTPUT-	
+5V	INPUT+	
AGND	INPUT-	

- **4-wire load cell cables**

For 4-wire load cell cables look at the drawing below:



SIGNAL FROM WEIGHING MODULE	SIGNAL FROM TENSOMETER	NOTICE
E	EKRAN	(according to the rule of connecting shields)
REF+	-	(JP1 solder)
REF-	-	(JP2 solder)
IN+	OUTPUT+	
IN-	OUTPUT-	
+5V	INPUT+	
AGND	INPUT-	

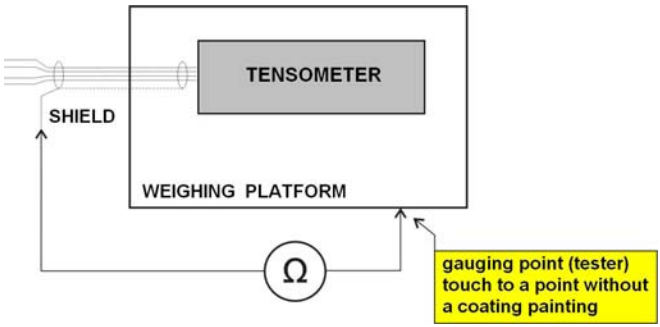
- **Connection of tensometer cable shield**

	With connection between the shield and the load cell body (manufacturer feature)	Without connection between the shield and the load cell body (manufacturer feature)
The scale with housing or stainless connected with the platform via cable.	**POINT B**	**POINT B**
Compact mechanical construction of the scale (e.g. a scale with the indicator on the pillar)	**POINT B**	**E**

Point B – screwed terminal electrically connected to the housing
E – soldering point on the main board

- **The way of checking connection between the shield and the tensometer body.**

Use an ohmmeter for this purpose.

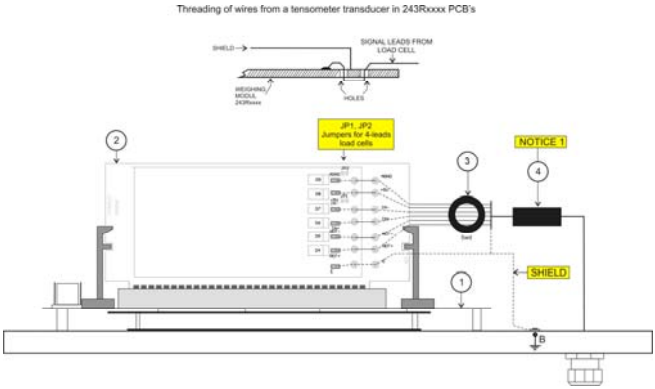


13.2.1. The way of installing inside PUE 5

Module is designated for assembly inside terminal PUE5. Module with **address 1** is assembled to main board of terminal to **J13(Slot 0)**, module with **address 2** is assembled to connector **J11 (Slot 1)**. For the second module **MW-02** gland is installed on casing lid, 3m cable ended with insulated conductors is led through gland.

Installing procedure:

1. Unplug the terminal (remove the plug from socket 230V);
2. Unscrew the casing lid (back part of terminal casing);
3. Install the module in connector J13 or J11 on main board, depending on it's address;



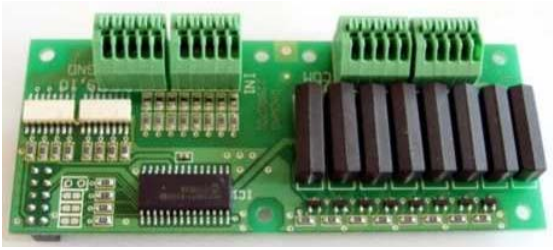
Installation of the module MW-02 on the motherboard terminal PUE 5

Pcs.	Component name
1	Motherboard
2	Weighing module
3	Round ferrite core
4	Ferrite core

4. While installing the module in the plastic socket on the main board turn you attention to the position of the module (see the figure below),

5. The tensometer cable led through additional gland PG7 situated on the back wall next to the gland of the main platform cable;
6. Pull a ferrite core on the cable (appropriate internal diameter);
7. Wind wires of the cable on the round ferrite core (5 coils);
8. The wires solder accordingly to pads on the PCB. **USE A SOLDERING IRON (not a soldergun with a transformer)**;
9. Connect cable IN/OUT to group of conductors (undo band clips fastening group of conductors, lay the cable and clamp band clips – multiple use band clips);
10. Assembly cover of indicator casing.

13.3. Additional 8 inputs / 8 outputs module



8 inputs / 8 outputs PCB - WE 8

This module can be connected inside the weighing terminal. Its task is to expand the functionality of terminal for 8 inputs and 8 outputs freely configurable.

13.3.1. Technical specification

Parameters of outputs	
Quantity of outputs	8
Type of outputs	Reed operation contacts
Wire diameter	0,14 - 0,5mm^2
Maximal load-current contact capacity	0,2A DC
Maximal forward voltage	50V DC

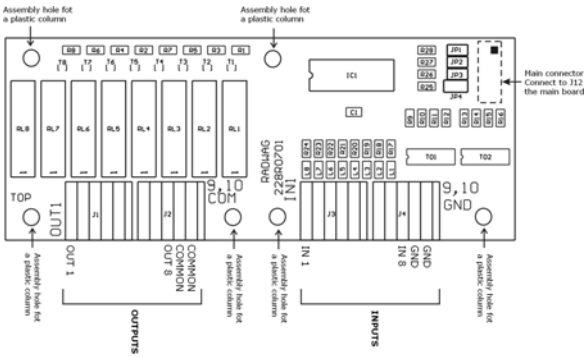
Parameters of inputs	
Quantity of inputs	8
Input type	Optoinsulated
Wire diameter	0,14 – 0,5mm^2
Control voltage range	5 -24V DC

13.3.2. Installing method in PUE 5 terminal

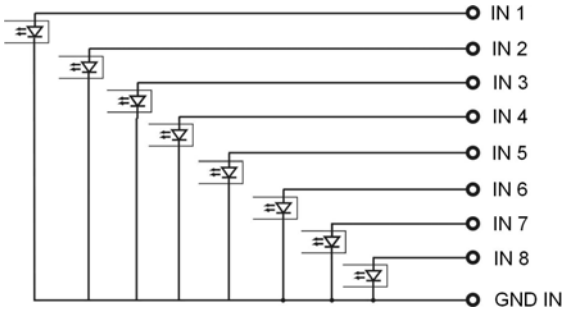
Module is designated for assembly inside terminal PUE5. Module is assembled to main board of terminal to 10-pin **J22** connector. For module **WE8** gland is installed on casing lid, 3m cable ended with insulated conductors is led through gland.

Installing procedure:

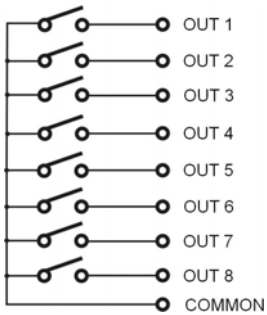
1. Unplug the terminal (remove the plug from socket 230V);
2. Unscrew the casing lid (back part of terminal casing);
3. Install the module in connector **J22** on main board;
4. While installing module pay attention to plastic posts fastening to main board. They should be placed in assembly holes in main board and in assembly holes in module WE 8,
5. In one of free glands remove the stopper and led through it cable IN/OUT (if necessary use bigger gland depending on cable diameter);
6. Connect the cable IN/OUT to joint **J1**, **J2** for outputs and **J3**, **J4** for inputs on module 8IN/8OUT according to description given in table;
7. Connect cable IN/OUT to group of conductors (undo band clips fastening group of conductors, lay the cable and clamp band clips – multiple use band clips);
8. Assembly cover of indicator casing.



13.3.3. I/O diagram



WE8 inputs diagram



WE8 outputs diagram

13.3.4. Description of input output wires PT0082:

SIGNAL	LEADS NUMBER (FOR JZ-500 18G0,5)
IN 1	1
IN 2	2
IN 3	3
IN 4	4
IN 5	5
IN 6	6
IN 7	7
IN 8	8
GND IN	9
OUT 1	10
OUT 2	11
OUT 3	12
OUT 4	13
OUT 5	14
OUT 6	15
OUT 7	16
OUT 8	17
COMMON	(18) YELLOW GREEN

13.4. WE 4 - 4 inputs / 4 outputs module

WE 4 module comprises 4 optoinsulated inputs and 4 optoinsulated outputs of reed relays, does not require installing additional modules on the main board of the terminal. The input / output wires are led out via a gland on the back wall of the housing (3m length).

13.4.1. Technical specification

Parameters of outputs	
Quantity of outputs	4
Type of outputs	Reed operation contacts
Wire diameter	0,14 - 0,5mm^2
Maximal load-current contact capacity	0,2A DC
Maximal forward voltage	50V DC
Parameters of inputs	
Quantity of inputs	4
Input type	Optoinsulated
Wire diameter	0,14 – 0,5mm^2
Control voltage range	5 -24V DC

13.4.2. Colours of cables for I/O PT0083:

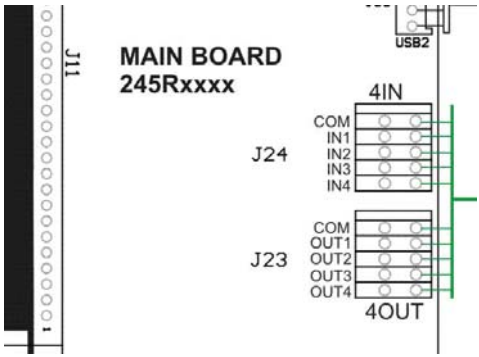
SIGNAL	LEADS NUMBER (FOR JZ-500 108G0,5)
IN 1	1
IN 2	2
IN 3	3
IN 4	4
GND IN	5
OUT 1	6
OUT 2	7
OUT 3	8
OUT 4	9
COMMON	(10) YELLOW GREEN

13.4.3. Installing method in PUE 5 terminal

WE 4 modules are equipped in one cable, for inputs and outputs.

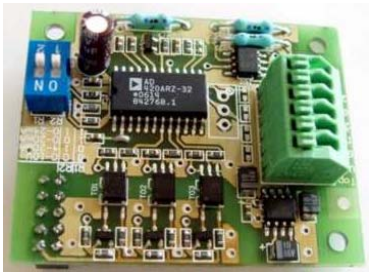
Installing procedure:

1. Unplug the terminal from mains;
2. Unscrew and take off the back wall of the housing;
3. Install a PG9 gland and led cable **PT0083** through it;
4. Connect the **PT0083** cable to the **J24** connector for inputs or to the **J23** for outputs, on the main board of PUE 5.
5. The cable connect to the group of wires (unhook band clips fastening the group of wires, lay the cable and hook the band clips). Band clips of multiple usage;
6. Screw down the back wall.



Installing WE4 modules on the main board of PUE 5

13.5. Analogue output module AN series.



Module of analogue outputs

Module accessible in three configurations:

- Voltage output **AN 0-10V**
- Current output **AN 4-20mA**
- Current output **AN 0-20mA**

13.5.1. Technical specification

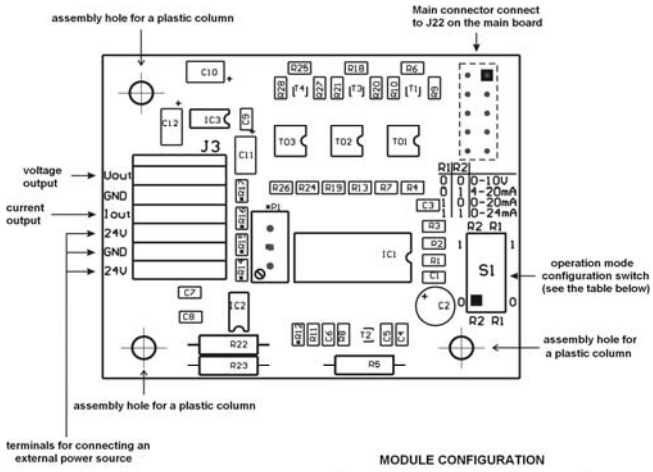
Work modes	4 - 20mA , 0 - 20mA, 0 - 10V
Resolution	16 bit
Current output resistance	<500 Ω
Voltage output resistance	>400 Ω
Power supply	24V DC (12 - 30V DC) max 40mA

13.5.2. The way of installing inside PUE 5

These modules are intended to mount inside PUE 5. They need to be connected to the 10-pin J22 connector. For all configurations of AN, there is a gland installed on the back wall of the housing. A 3-meter shielded cables are led out via the gland. Wires should be free from insulation.

Installing procedure:

1. Unplug the terminal from mains;
2. Unscrew and take off the back wall of the housing;
3. Install your module in J22 on the main board;
4. During installation turn your attention to plastic columns. They should be placed one side in mounting holes in the main board and the other side in the mounted module;
5. Led the PT0015 cable through one of the free glands;
6. Connect the PT0015 cable to J3 on the analogue module according to the description below;
7. Connect the PT0015 cable shield to the housing (screwed terminator, 4mm diameter);
8. The cable connect to the group of wires (unhook band clips fastening the group of wires, lay the cable and hook the band clips). Band clips of multiple usage;
9. Screw down the back wall.



MODULE CONFIGURATION

R1	R2	Operation mode
0	0	0-10V
0	1	4-20mA
1	0	0-20mA
1	1	0-24mA

ANALOGUE OUTPUTS' MODULE CURRENT LOOP 4-20 mA SET AS DEFAULT

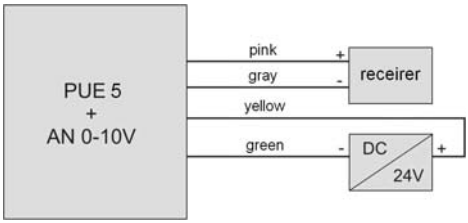
*Mounting of **AN** module on the main board of PUE 5*

13.5.3. Configuration of work modes of analogue modules

A work mode of analogue modules can be set using **S1** switch according to the drawings above (table „*configuration of analogue modules* ”).
Near the **S1** switch on the PCB you can find a description

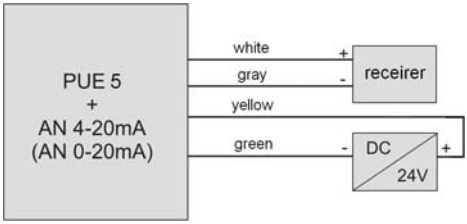
13.5.4. Connections to AN module

Drawing of connections of voltage output:

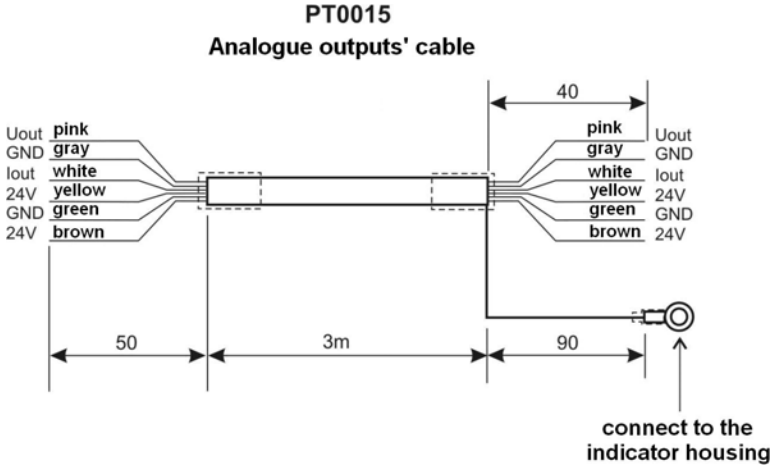


COLOURS OF WIRES	
Colour	**Signal**
Pink	U_{OUT} +
Gray	GND
Yellow	+24V DC
Green	GND

Drawing of connections of current loop:



COLOURS OF WIRES	
Colour	**Signal**
White	I_{OUT} +
Gray	GND
Yellow	+24V DC
Green	GND



Cable for analogue output

13.6. Profibus interface DP V1.

Profibus Plug-In Module

PUE5 weighing terminals can be optionally equipped in Profibus Plug-In Modules of DPV1 standard with connectivity via the uniform **Anybus-CompactCom**. A detailed description of the interface is in a separate manual Profibus PUE5.

13.6.1. Technical specification

Size	52mm x 50mm x 22mm
Power Supply	3,3 V DC
Temperature	-10 do +40°C
BUS Baud Rate	Auto Baud Rate
I/O Input	244 bajtów (Max 368 bytes IN+OUT)
I/O Output	244 bajtów (Max 368 bytes IN+OUT)
Appl Interface	serial
Internal baud rates	19.2; 57.6; 115.2; 625 kbps (internal DIP SWITCH)
Baud Rate Error	±1.5%

13.6.2. Colours of wires

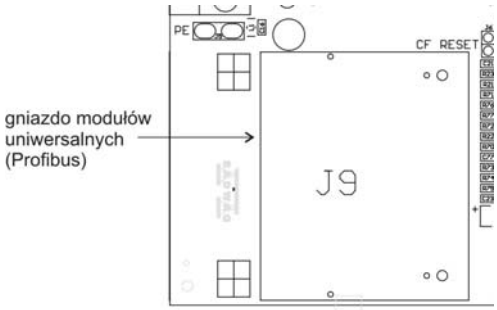
A	Green
B	Red

13.6.3. The way of installing inside PUE 5

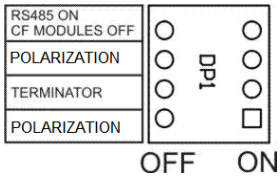
These modules are intended to mount inside PUE 5. They need to be connected to the **J9**. There is a gland installed on the back wall of the housing. A 3-meter shielded cables are led via the gland. Remove insulation from wires.

Installing procedure:

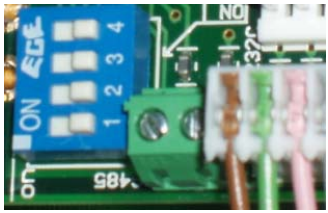
1. Unplug the terminal from mains;
2. Unscrew and take off the back wall of the housing;
3. Install your module in **J9** on the main board;



4. Screw down the interface using 2 screws;
5. Set the DIP-SWITCH **DP1** (RS485 – CF MODULES) in position OFF,

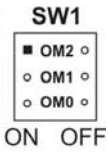


Switch settings **DP1**:
1 – ON



6. Set **SW1** to 115,2 kbs.,

SPEED	OM2	OM1	OM0
19,2kbps	OFF	OFF	ON
57,6kbps	OFF	ON	OFF
115,2kbps	OFF	ON	ON
625kbps	ON	OFF	OFF



Switch settings **SW1**:
1 – ON
2 – ON
3 – OFF

7. Connect socket SUB-D with a cable,
8. Remove the hole plug from one of the free glands and led the cable through;
9. The cable connect to the group of wires (unhook band clips fastening the group of wires, lay the cable and hook the band clips). Band clips of multiple usage;
10. Screw down the back wall.
11. Set in the MS Windows Device manager, USB serial port on **COM4**

14. ADDITIONAL EQUIPMENT

Additional weighing platform module	-	Metrological parameters as for main platform
In / out module	-	Additional 8 in / out
Profibus DP V1 interface	-	Slave working mode

15. TECHNICAL PARAMETERS

Casing	stainless steel
IP rating	IP65
Screen	LCD 12,1" (800x600) touch screen
Power supply	85-265 VAC 50-60Hz
Power consumption	45W
Power supply of external devices	2×5 V 500 mA
Working temperature	0°C to +40°C
Storage temperature	-20°C to +60°C
Maximal quantity of divisions from converter	8 388 608
OIML Class	III
Maximal quantity of verifying units	6 000
Maximal increase of signal	19 mV
Maximal voltage on 1 verifying unit	3.3 µV
Minimal voltage on 1 verifying unit	1 µV

Minimal impedance of load cell	90 Ω
Maximal impedance of load cell	1200 Ω
Power voltage of load cell	5 V
Connection of load cells	4 or 6 cables + screen
Processor	Intel® Atom™ N270 1.6 GHz
Chipset	Intel® 945GSE, Intel® ICH7M
RAM memory	max. 2 GB DDR2
Data memory	HDD 160GB SATA
Graphic card memory	max. 224 MB DVMT 3.0
Ethernet	10/100 Mbps
Optoinsulated interfaces	RS 232C, RS 485
USB interface	2 x USB 2.0 (max. intensity 500mA)
In/out	4 in, 4 out

MANUFACTURER

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